Mixing Zones

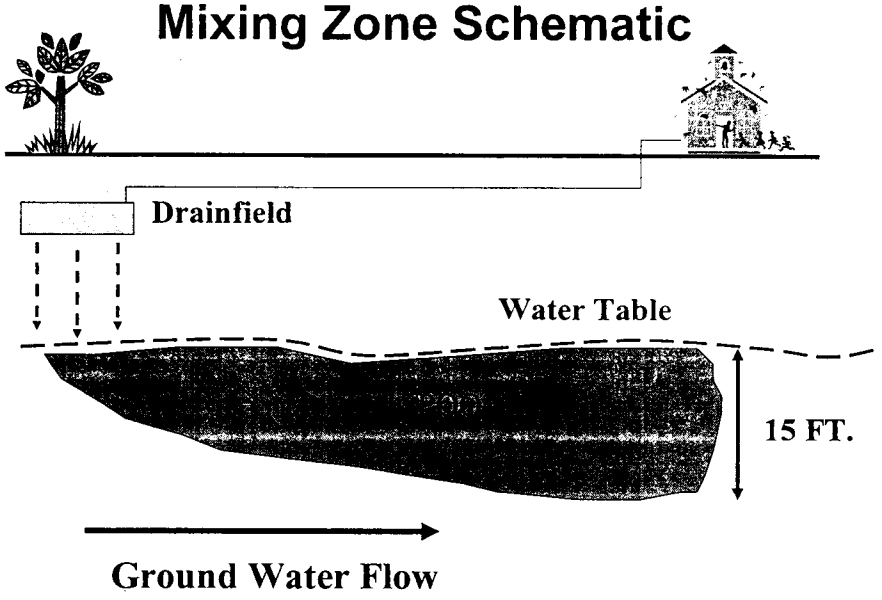
- Presented to the WPIC July 26, 2010

- Steve Kilbreath
- Montana DEQ

Authority

- 75-5-301(4), 75-5-302 through 75-5-307 and 80-15-201 MCA
- ARM 17.30.501-518 & 17.30.701-718
- Mixing zones apply to many uses
- LC9004 only applies to new parcels being reviewed under the Sanitation and Subdivisions Act (76-4 MCA)
- All new sources need to have a mixing zone

Mixing Zone Schematic



Mixing Zones

BOTH primary and replacement drainfields (with 5° dispersion on each side) must be drawn along direction of ground-water flow (direction of gradient)

Standard mixing zones (A.R.M. 17.30.517(1)(d)(viii))

Single-family < 2 acres: 100 feet

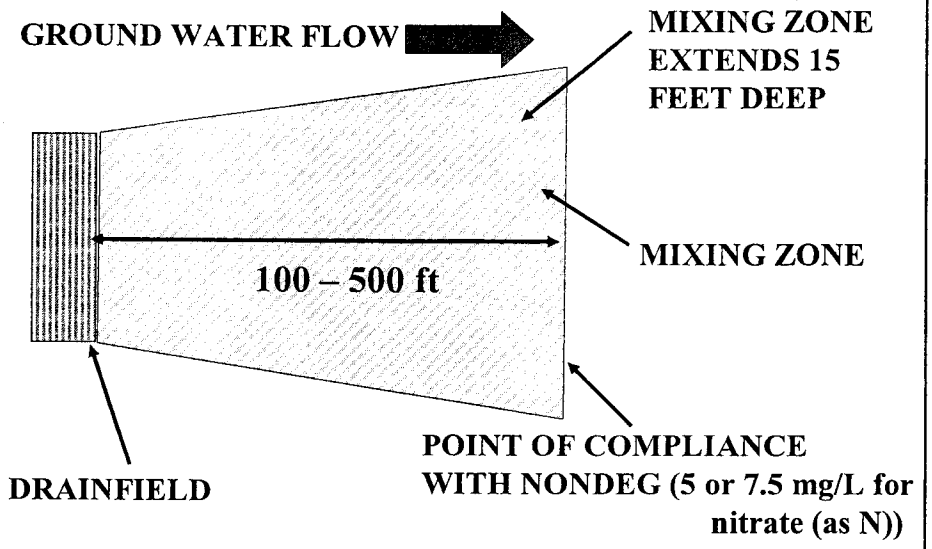
Single-family ≥ 2 acres, subdivision 5 -10 acres: 200 feet

Single-family ≥ 2 acres, subdivision <5 or >10 acres: 500 ft

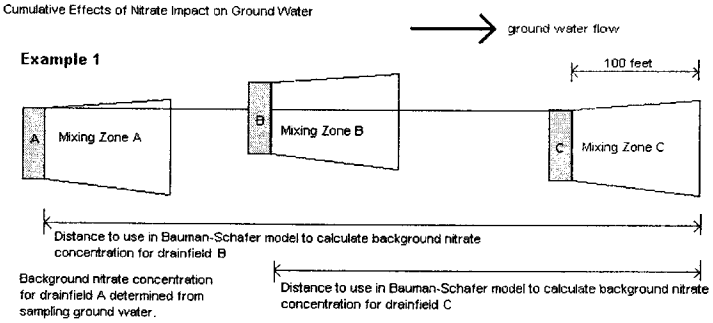
Commercial, public, and multi-user drainfields: 500 feet

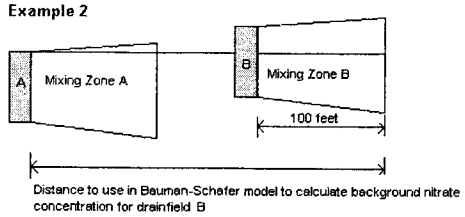
Source-specific mixing zones may be requested.

Ground Water Mixing Zone (map view)



APPENDIX L
Cumulative Effects of Nitrate Impact on Ground Water





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Allowed Nitrate Concentration for Non-degradation

Background Nitrate (as Nitrogen) levels (mg/L)	Allowed Nitrate Concentration at end of Mixing Zone (mg/L)
0.0 to 5.0	5.0 (for standard sewage system) 7.5 (for Level 2 treatment)
5.0 to 7.5	7.5 (nitrate is primarily from sources other than human waste; otherwise, no increase above background level) 7.5 (for Level 2 treatment)
7.5 to 10.0, >10.0	NO INCREASE

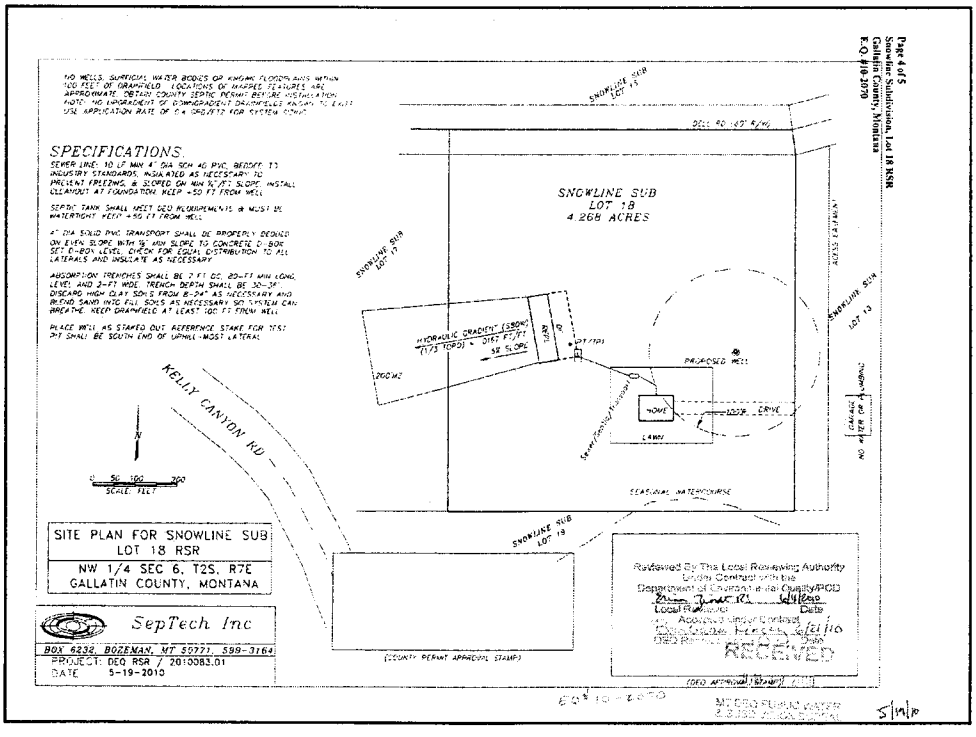
Non-degradation Guidance Document

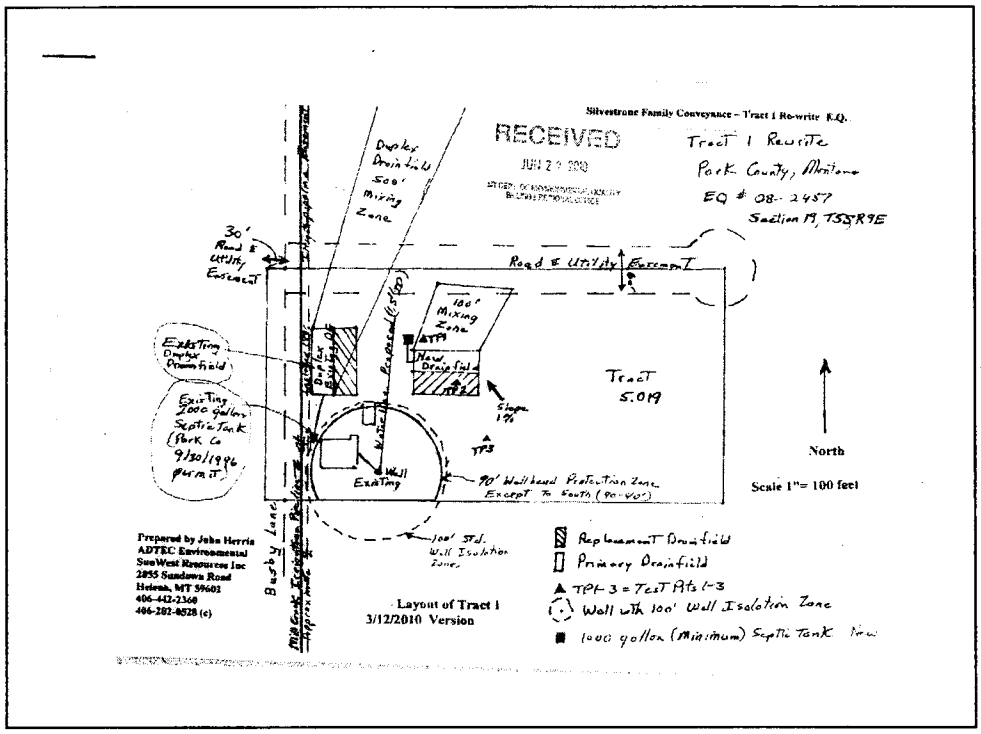
How to Perform a Non-degradation Analysis for Subsurface Wastewater Treatment Facilities and Appendixes

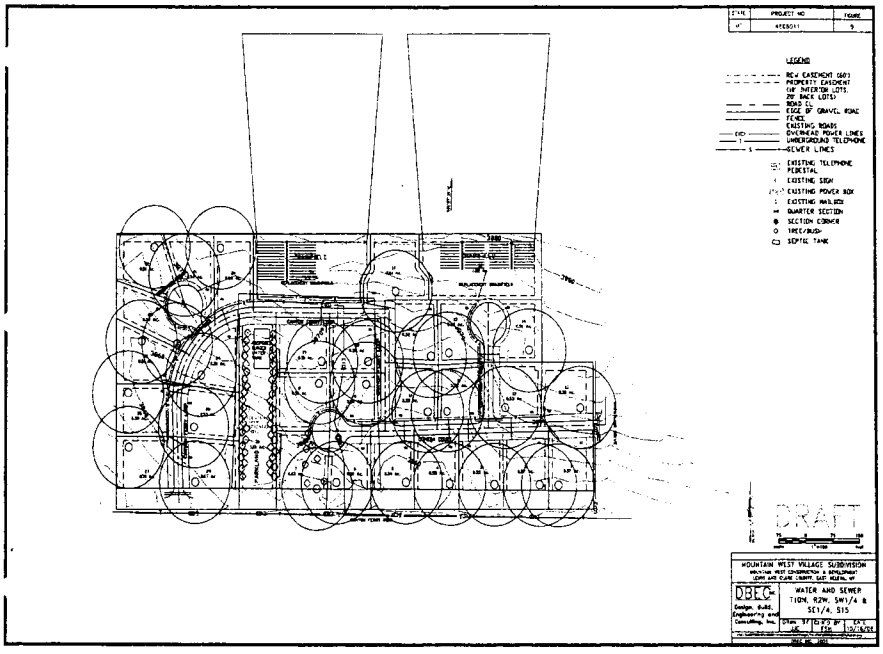
http://deq.mt.gov/wqinfo/Nondeg/Index.asp

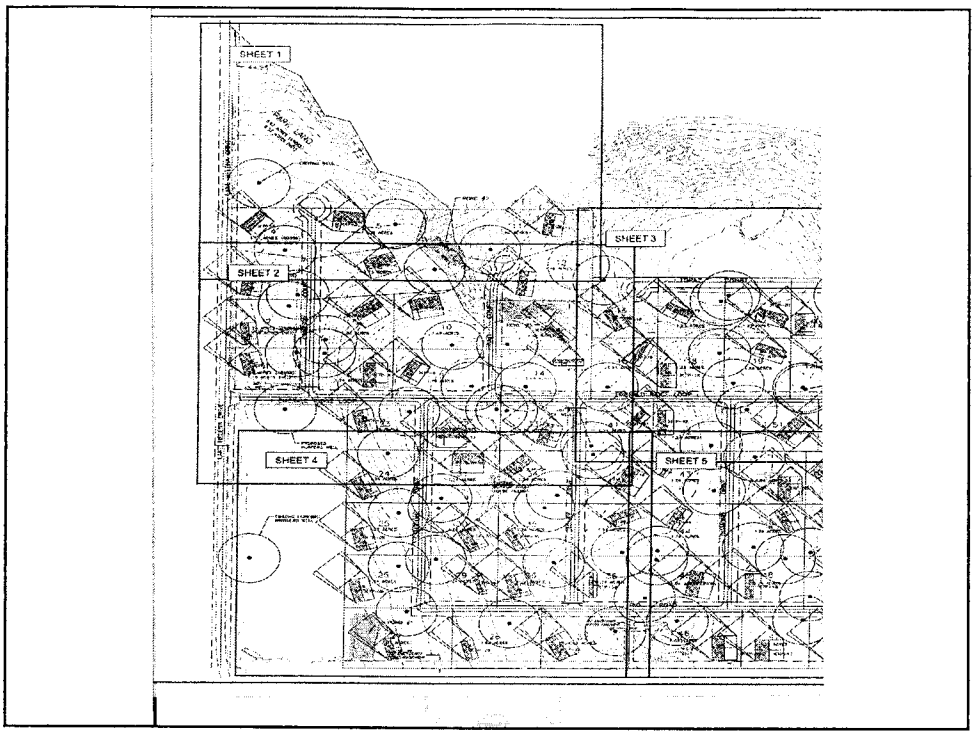
Examples

- Well radius of 100' = 40,000 sq ft
- 100 ft wide mxnzn x 100' = 10,000 sq ft
- Lot with well and mxnzn = 200' x 350' = 70,000 sq ft = 1.6 acres in an ideal world




Silvestrone Family Conveyance – Tract 1 Re-write E.Q.
RECEIVED
JUN 2 9 2010
Tract 1 Rewrite
Park County, Montana
EQ # 08-2457
Section 19, T5S R9E
Dunker Drainfield 500' Mixing Zone
30' Road & Utility Easement
Road & Utility Easement
100' Mixing Zone
ATP1
New Drainfield
TP2
Slope 1%
TP3
Existing Dunker Drainfield
Existing 2000 gallon Septic Tank (Park Co 9/30/1996 permit)
Dunker Drainfield
Existing Well
90' Wellhead Protection Zone Except To South (90'-WO')
100' Std. Well Isolation Zone
Tract 5.01
North
Scale 1"= 100 feet
Prepared by John Herrin
ADTEC Environmental
SueWest Resources Inc
2855 Sundown Road
Helena, MT 59602
406-442-2360
406-202-0528 (c)
Layout of Tract 1
3/12/2010 Version
Replacement Drainfield
Primary Drainfield
TPT 3 = Test Pits 1-3
Well with 100' Well Isolation Zone
1000 gallon (Minimum) Septic Tank New


LEGEND
DRAFT
MOUNTAIN WEST VILLAGE SUBDIVISION
DBEC
WATER AND SEWER


SHEET 1
SHEET 2
SHEET 3
SHEET 4
SHEET 5